

# Study of Acute Poisoning Cases in Children Admitted To Menoufia Poison Control Center (MPCC) During the Year (2016)" A Prospective Study"

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## Abstract

**Background:** Poisoning of children is a major health problem in the developing as well as the developed world; it represents an important cause of morbidity and mortality in children and adolescents.

**Objectives:** This study was designed to describe the pattern of childhood poisoning cases admitted to Menoufia Poison Control Center (MPCC) at Menoufia University Hospital over one year. **Patients and Methods:** This was a prospective study conducted on 760 children less than 18 year with acute poisoning and all required data about socio-demographic status, poison data and clinical assessment were collected and statistically analyzed.

**Results:** The total number of cases during the period of study was (760) cases, males outnumbered females (55.5% versus 44.5% respectively). Those from 2 to 6 year were the highest age group which represented 62.1%. Pesticide poisoning was the most common exposure (34.4%) followed by household cleaning agents (30%). Most of poisoned cases were accidental (91.7%) while only 8.3% were suicidal. The most common route of poisoning was oral one (92.6%). Seasonal variation was noticed as regards rate of admitted cases with increased rate in summer and spring. Pesticides were the most common agents resulting in death (13cases of 15). According to poison severity score (PSS) 65.8% of cases were minor followed by moderate, asymptomatic and severe cases (21.7%, 9.7% and 2.8% respectively). About 9.6% needed ICU admissions, 95.9% of cases were cured and mortality rate was 2 %.

**Conclusion:** Most children poisoning was accidental, mainly by oral route, more in summer and spring seasons, most commonly due to pesticides and household cleaning agents. Most of cases were completely cured.

**Recommendations:** All medications and toxic products should be kept out of reach of children, availability of child resistant containers, mass media should create awareness about this problem and finally, good parental supervision is always necessary.

## Introduction

Poisoning is one of the most common causes of admission to pediatric emergency and intensive care units. Poisoning in children represents an important cause of injury-related morbidity and mortality in the developing as well as the developed world (Sandra, 2010).

The U.S. poison control centers in 2014 provided telephone guidance for nearly 2.2 million human poison exposures. That's about 6.7 poison exposures/1000 populations, 42.6 poison exposures in children younger than 6 years/1000 children (Mowry et al, 2015)

Children are active and explore their world with all their senses specially taste. As a result, the home and its surroundings can be a dangerous place when poisonous substances are inadvertently ingested. Every

year thousands of children are admitted to emergency departments. Poisoning patterns change according to age group, type of exposure and the nature and dose of the poison (WHO, 2008).

**The aim of this work** is to describe the pattern of childhood poisoning cases admitted to Menoufia Poison Control Center (MPCC) at Menoufia University Hospital over one year (From the first of January 2016 to the end of December 2016), through analyzing the socio-demographic data, circumstances and motives, types of poisons, severity of poisoning and outcome of these cases .

### Patients and Methods

This was a prospective study conducted on all cases of childhood poisoning admitted to Menoufia Poison Control Center (MPCC) during the period from 1st of

January 2016 to the end of December 2016 after obtaining ethical approval from the Ethical Committee at Menoufia University Hospital and after taking written consent from their guardians. This center of control poisoning is the only center in the governorate, where any poisoning case that needs consultation is referred to. After taking approval from the director of MPCC data were collected in patient's clinical sheets developed for this purpose including all required data about socio-demographic data, circumstances, types of poisons, clinical presentation, severity of poisoned cases, (severity of poisoning was classified according to poisoning severity score (Persson et al., 1998) and their outcome. The poison severity score (PSS) is a scoring system which classify poisoned cases into four grades, None (0): no symptoms or signs related to poisoning, Minor (1): mild, transient and spontaneously resolving symptoms, Moderate (2): pronounced or prolonged symptoms, Severe (3): severe or life-threatening symptoms, Fatal (4): death. Investigations for the cases were done when needed in the form of biochemical laboratory investigations and specific toxicological screening tests for detection of type of poisons as choline esterase level for organophosphorous and carbamate poisoning, silver nitrate test for detection of aluminum or zinc phosphide poisoning, drug screening tests and radiological investigations when needed. Treatment in the form of observation with or without supportive measures together with decontamination whenever needed in asymptomatic and mild cases and when no antidotal therapy is present for that poisons. These measures were combined with antidotal therapy when available. Cases were admitted to intensive care unit when needed for continuous cardiac monitoring or mechanical ventilation. Neuropsychological consultation for cases with suicidal poisoning was done as a part of treatment. All data were kept anonymous to ensure confidentiality of data and with no conflict of interest.

Exclusion criteria included cases presented with allergic reactions to food or food poisoning cases, cases associated with work place hazards and cases of drug or substance abuse.

### Statistical Analysis

Data were tabulated and statistically analyzed using Statistical Package for the Social Sciences (SPSS) for windows version 16.0. Statistical analysis and tabulation were done according to (Dawson and Trapp, 2001). Categorical data were expressed as number and percentage and were compared using chi square test. P-value of 0.05 or less is considered significant, P-value of 0.01 or less is considered highly significant and P-value of >0.05 is considered insignificant.

### Results

The total number of cases during the period of study was (760) cases, males outnumbered females (55.5% versus 44.5% respectively). Patients were divided into 4 groups according to their ages: younger than 2 year, those between 2 and 6 years, those between 6 and 12 years, and those between 12 and 18 years. Those from 2 to 6 years represented the highest age group (62.1%) followed by age groups of 12 – 18 years, less than 2 years

(15% and 12.9% respectively) and the least was 6-12 years (10%). Poisoned cases from rural areas represented (59.1%), while 40.9% were from urban areas (Fig.1).

Pesticide poisoning was the most common exposure 34.4% of the total cases which include insecticides (26.8%) in the form of organophosphates and carbamates and rodenticides 4.1% in the form of zinc phosphide.

The second most common poisoning was household cleaning agents 30% mostly in the form of potash, phenol, bleaches and laundry detergents. Therapeutic drugs constituted 17.2% of the causes of poisoning. These drugs included cardiovascular drugs (36.7%), cold medications in the form of cough suppressants and antihistaminic (19.8%), hypoglycemic drugs (16.8%), neurologic drugs (14.5%) and lastly analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) in 12.2% of cases. Petroleum products like benzene and kerosene in (9.6%), carbon monoxide in 2.9% of cases, lastly animal bites in the form of snake bite and scorpion stings in (2.6%), while unidentified agents in (3.3%) of cases (Fig 2).

The most common route of poisoning was oral one (92.6%) followed by inhalation, animal bite and lastly through skin exposure (4.1%, 2.6 % and 0.7% respectively). Most of poisoned cases were accidental (91.7%) while only 8.3% were suicidal. Seasonal variation was noticed as regards rate of admitted cases, as the largest percent (33.4%) were poisoned in Summer followed by Spring (30.8%), while Winter and Autumn have lower rates (18.6 % and 17.2% respectively). Cases admitted to hospital from 2 to 4 hours of poisoning represented (49.2%), followed by cases which were admitted to hospital after more than 4 hours of the poisoning (30.8%) while (20%) of cases were admitted within two hours. The poisoned cases were classified according to poison severity score (PSS) where highest percent of cases (65.8%) were minor followed by moderate, asymptomatic and severe cases (21.7%, 9.7% and 2.8% respectively).small percent of cases (9.6%) needed ICU admissions while (90.4%) of cases were admitted to the poisoning control department. The majority of cases (74.6 %) stayed from 1 day to less than 3 days, 16% of cases stayed less than one day 8.6% stayed from 3 to 7 days and only 0.8 % stayed more than one week. Cure rate was (95.9%) of cases versus (2%) mortality rate and (2.1%) was of unknown outcome as they were discharged against medical advice (Table 1).

The relation between the sex and age of the affected children was highly significantly different, where males outnumbered females in age group 2- <6years and from 6 to 12 years (59.3% and 64.5% versus 40.7% and 35.5% respectively), while females outnumbered males in the age group 12-18years (63.2% versus 36.8% respectively) ( $X^2 = 21.815$  and P value <0.01) (Fig 3).

Highly significant relation was found between the sex and mode of poisoning as the highest percent of suicidal poisoning (73%) were females, while 58.1% of accidental toxicity was males ( $X^2 = 22.662$  and P value <0.01) (Fig 4).

There were different types of poisoning exposures among the selected age groups. Pesticides and household cleaning agents were the most common types of poisoning in children less than 2years and those aged 2-6 years while in the older age groups 6-12 years and 12-18 years pesticides and drugs were the most common types (Table 2).

As regards severity of poisoning in different age groups 51.4% of asymptomatic cases were encountered in children < 2years , most of mild and moderate severity of poisoning were found in children 2-6years, (64.6% and 76.4% respectively) while 61.9% of severe cases were aged 12-18years (Table 3).

Many risk factors were statistically significant affecting the outcome of the studied cases where (73.3%) of the dead cases were females, 44.8% and 37.9% of dead cases were in age group between 12-18 and 2-6 years respectively, 55.2% of dead cases came to hospital after 4 hours and 93.1% of dead cases were scoring as severe cases (grade 3) according to PSS. ( $X^2=9.22, 80.919, 23.336$  and  $442.963$  respectively and P value = 0.01, 0.001, 0.001 and 0.001 respectively) (Table 4).

As regards patient outcome in relation to the type of poison, most patients were cured in different types of poisoning while pesticides (insecticides and rodenticides) were the most common agents resulting in death (13cases of 15 cases) ( $X^2=104.137$ , P value = 0.01) (Table 5).

As regards dead cases they were 15 cases; 13 cases were died from suicidal pesticide poisoning in the

age of 12-18years old; 10 of them were due to zinc phosphide poisoning presented with severe cardiac depression and arrested within 24-48 hours in spite of supportive treatment and 3cases were due to organophosphorous poisoning presented with severe clinical manifestations and were admitted to ICU on mechanical ventilation but they were arrested in spite of standard treatment within 12-24 hours. Finally the remaining 2 cases were less than 2 years old died from accidental corrosive poisoning, they were represented with severe corrosion of mouth, they were admitted to ICU on mechanical ventilation then develop respiratory complications in the form of pneumothorax in one case and trachea-pleural fistula with development of hydropneumothorax in the other one, both cases were treated with intercostal tube insertion and with insertion of esophageal stent in the case which develop fistula but both cases were deteriorated with development of septicemia, coagulopathy and fever then arrested after 15 days in one case and 22 days in the other.

Treatment in the form of observation with or without supportive measures together with decontamination whenever needed was sufficient in asymptomatic and mild cases and when no antidotal therapy is present. These measures were combined with antidotal therapy when available. Intercostal tube insertion was done in 2 cases of corrosive poisoning. Neuropsychological consultation for cases with suicidal poisoning was done as a part of treatment.

**Table 1: Medical characters and circumstances of poisoning in the studied cases**

Variable	No	%	
<b>Route of exposure</b>	Oral	704	92.6
	Inhalational	31	4.1
	Animal bite	20	2.6
	Skin	5	0.7
<b>Mode</b>	Accidental	697	91.7
	Suicidal	63	8.3
<b>Season</b>	Summer	254	33.4
	Autumn	131	17.2
	Spring	234	30.8
	Winter	141	18.6
<b>Delay time</b>	Within 2 hrs	152	20
	2 hrs to 4 hrs	374	49.2
	> 4 hrs	234	30.8
<b>Poison severity score (PSS)</b>	Asymptomatic (grade 0)	74	9.7
	Minor (grade 1)	500	65.8
	Moderate (grade 2)	165	21.7
	Severe (grade 3)	21	2.8
<b>Admission status</b>	Department	687	90.4
	ICU	73	9.6
<b>Period of stay in hospital</b>	<1day	122	16
	1- 3day	567	74.6
	3-7days	65	8.6
	>week	6	0.8
<b>Outcome</b>	Cured	729	95.9
	Died	15	2
	Unknown	16	2.1

**Table 2: Chi square analysis of age group in acute poisoned cases according to the type of poison.**

		Age				X2	p.value	
		<2y	2-6y	6-12y	12-18y			
Type of poison	Household cleaning agents	No	25	182	9	154.331	0.000**	
		%	25.5	38.6	11.8			10.5
	Petroleum products	No	17	41	11			4
		%	17.3	8.7	14.5			3.5
	Pesticides	No	36	143	30			52
		%	36.7	30.3	39.5			45.6
	Drug	No	14	79	12			26
		%	14.3	16.7	15.8			22.8
	Animal bite	No	0	1	5			14
		%	0	0.2	6.6			12.3
	Undetermined	No	6	19	0			0
		%	6.1	4	0			0
	Carbon monoxide	No	0	7	9			6
		%	0	1.5	11.8			5.3
Total	No	98	472	76	114			
	%	100.0%	100.0%	100.0%	100.0%			

\*\* = highly significant,  $p < 0.01$

**Table 3: Chi square analysis of age group in acute poisoned cases according to poisoning severity score.**

Age	Poison Severity Score								X2	p. value
	Asymptomatic (Grade 0)		Minor (Grade1)		Moderate (Grade2)		Severe (Grade3)			
	No	%	No	%	No	%	No	%		
<2y	38	51.4	48	9.6	10	6.1	2	9.5	174.021	0.000**
2-<6y	17	23	323	64.6	126	76.4	6	28.6		
6-<12y	10	13.5	44	8.8	22	13.3	0	0		
12-<18y	9	12.2	85	17	7	4.2	13	61.9		
Total	74	100.0%	500	100.0%	165	100.0%	21	100.0%		

\*\* = highly significant,  $p < 0.01$

**Table 4: Chi square analysis of the outcome of acute poisoned cases in relation to sex, age groups, delay time and poison severity score.**

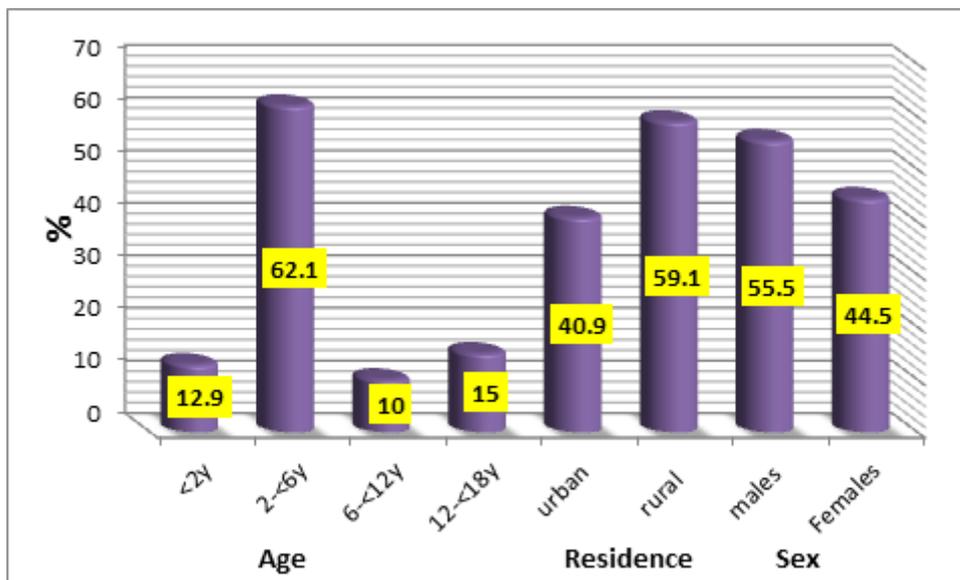
		Outcome						X2	P Value
		Cured		died		unknown			
		N=	%	N	%	N	%		
Sex	Male(N=422)	413	56.7	4	26.7	5	31.2	9.22	0.010*
	Female(N=338)	316	43.3	11	73.3	11	68.8		
Age	<2y	94	12.9	2	13.3	2	12.5	80.919	0.000**
	2-6y	468	64.2	0	0	4	25		
	6-12y	70	9.6	0	0	6	37.5		
	12-18y	97	13.3	13	86.7	4	25		
Delay time	Within 2 h	143	19.6	1	6.7	8	50	23.336	0.000**
	2 h to 4 h	364	49.9	3	20	7	43.8		
	> 4 h	222	30.5	11	73.3	1	6.3		
Poison Severity Score	Asymptomatic	65	8.9	0	0	9	56.2	442.963	0.000**
	Minor	493	67.6	0	0	7	43.8		
	Moderate	163	22.4	2	13.3	0	0		
	Severe	8	1.1	13	86.7	0	0		

\*=highly significant,  $p < 0.05$ , \*\* = highly significant,  $p < 0.01$

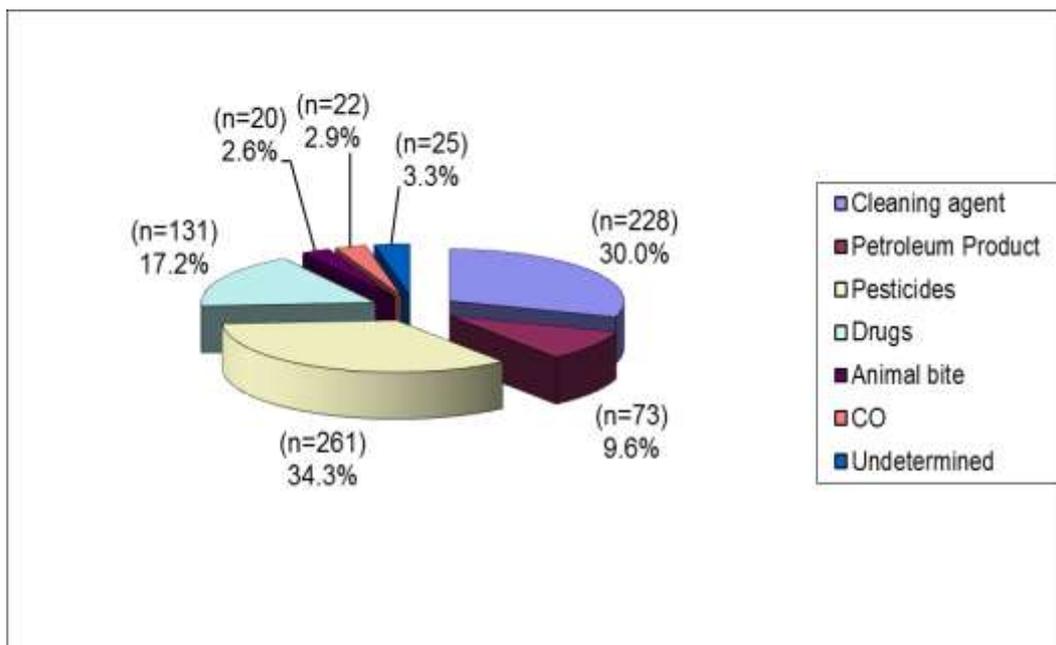
**Table 5: Chi square analysis of the outcome of acute poisoned cases in relation to the type of poison.**

		Type of poison							X2	P.value
		Cleaning agents	Petroleum products	Pesticides	Drug	Animal bite	Un-determined	CO		
		No=228 %=100	No= 73 %=100	No= 261 %= 100	No= 131 %= 100	No= 20 %= 100	No= 25 %= 100	No= 22 %= 100		
<b>Outcome</b>	Cured	223 97.8%	72 98.6%	246 94.3%	128 97.7%	20 100%	18 72%	22 100%	104.137	0.000**
	Died	2 0.9%	0 0%	13 5%	0 0%	0 0%	0 0%	0 0%		
	Unknown	3 1.3%	1 1.4%	2 0.8%	3 2.3%	0 0%	7 28%	0 0%		

\*\* = highly significant,  $p < 0.01$



**Fig 1: Distribution of acute poisoned cases according to age, sex and residence.**



**Fig 2: Distribution of acute poisoned cases according to types of toxic substances.**

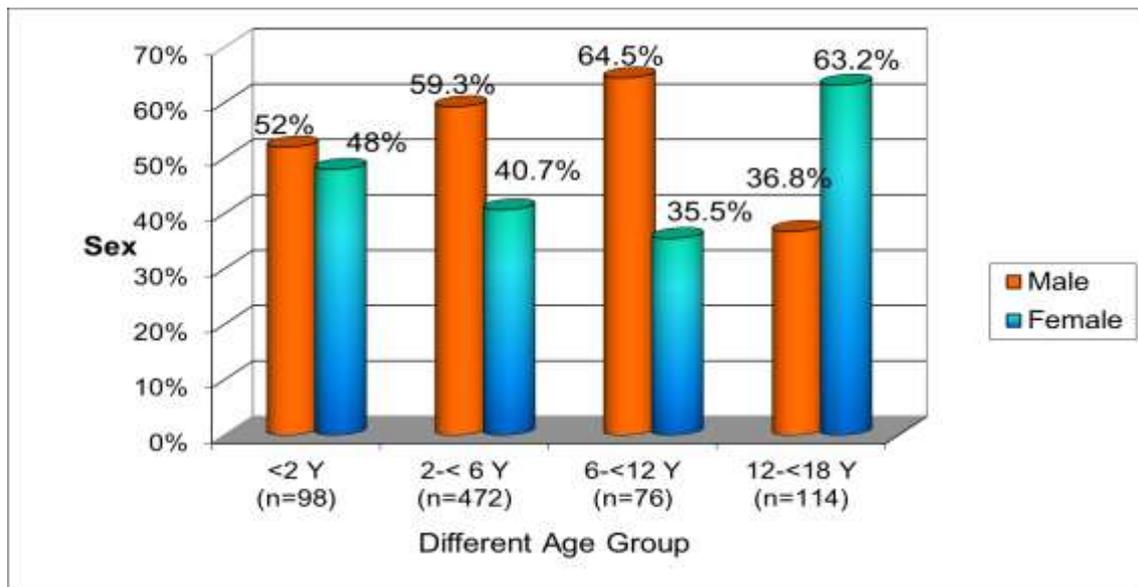


Fig 3: Distribution of acute poisoned cases according to different age groups in both sexes. ( $\chi^2 = 23.235$  and P value  $< 0.001$ )

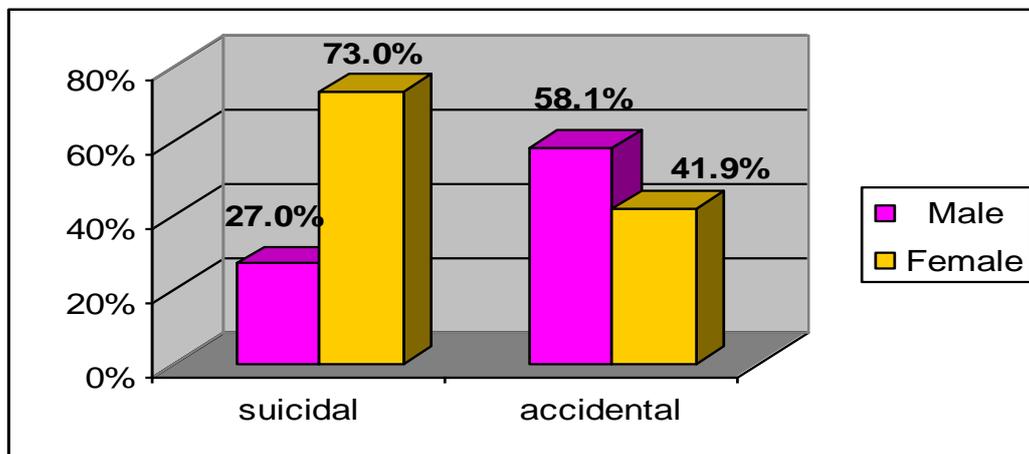


Fig 4: Distribution of acute poisoned cases according to the mode of poisoning in both sexes ( $\chi^2 = 7.1$  and p-value = 0.007).



Fig 5: A case of 2 years old female patient with history of accidental corrosive poisoning showing swelling and hyperemia of the upper and lower lips with drooling of saliva.



**Fig 6: Radiograph of plain x- ray chest (antero-posterior view) of female child with corrosive poisoning showing right sided hydro-pneumothorax. \**



**Fig 7: Radiograph of plain x- ray chest (antero-posterior view) of female child with corrosive poisoning showing right sided pneumo-mediastinum (red arrows) indicating air in mediastinum.**

### Discussion

Acute poisoning is one of the important causes of emergency unit admissions. Identification and documentation of epidemiological aspects and other variables in childhood poisoning are of great importance for determination of proper preventive measures. In the present study the total number of the admitted cases during the period of study was (760) case which accounted for 34.5% of acute poisoning cases admitted to the toxicology department through the period of the study. The higher percentage of male to female patients in this study (55.5% versus 44.5% respectively) is in line with most studies (Ahmed et al, 2011 and Akhtar, 2006) as males are more active than females and have more freedom to go outside to the field with their parents or for playing which increase their liability to accidental poison exposure.

Children less than 6 years age constituted about 75% of cases (62.1% were between 2 - < 6years and 12.9% were less than 2years). In this age range, children are curious about the surrounding environment, unaware of the impending danger and explorative in behavior and tend to have accidents, especially from putting substances or colored objects in the mouth. These findings agree with worldwide findings (Hahn et al, 2013 and Andrade et al, 2012).

In the present study, there is a highly statistically significant relation between both sexes in different age groups where males outnumbered females in age groups 2-<6years and 6-<12years while females were more frequent in poisoning of older age group (12 - <18y). These data were similar to those described in a study carried out in Ankara, Turkey by Andiran and

Sarikayalar, 2004 who found that in 489 poisoning cases poisonings <10 years of age were more frequent in males whereas poisonings >10 years of age were more common in females as in this older age poisoning is usually suicidal in nature which is more common in females.

Oral route was the most common route of poisoning (92.6%) as young child is used to explore objects found in the surrounding environment by putting it in his mouth and also older children were exposed to toxic substances mainly by ingestion due to the bad habit of putting these toxic substances in non-original containers thus resulting in unintentional poisonings and also suicidal poisoning is mainly done by oral route. These results were in agreement with several of studies as Alije et al, 2014 reported that oral route constituted 81.65% and Alazab, 2012 stated that 99.3% of the poisonings occurred via oral routes.

The current study showed that the number of poisoned children was higher in rural areas than that in urban areas; these results were in agreement with that of Hassan and Siam, 2014. This was probably due to the fact that neglect of parents to their children is more common in rural areas in addition to more availability of these poisons in rural areas either at home or at field for agricultural purposes. This result was in contrary with that noted by Alazab, 2012 in his study in Egypt, who reported higher incidence in urban areas (79.9%) versus rural ones (20.1%), but this is may be due to different nature of the selected area of his study which is mainly urban in nature.

As regards mode of poisoning in the current study, the vast majority of cases was poisoned accidentally (91.7%) similar to those reported by Paudyal, 2005 (unintentional poisoning 98.4%). Cases of suicide in our study represented only (8.3%) of cases with no homicidal exposures. Suicidal cases were adolescents and more common in females. Bacha and Tilahun, 2015 in their study reported 15.5% intentional poisoning. Different suicidal rates in different studies may be due to different study designs and cultures. The reason for the high frequency of suicide attempts of female adolescents compared to male adolescents can be explained by the fact that male adolescents have more freedom of decision and action, in comparison to female adolescents, who are restricted by customs and traditions which make them more affected by family disorders, loss of a parent member, divorced parents, failure in love or education. As regards seasonal variation of poisoned cases in the present study, it was noticed that Summer and Spring were the most vulnerable period for poisoning in children (33.4% & 30.8% respectively) as these hot dry seasons children became thirsty and took liquid poisons contained in the soft drink bottles and mineral water unintentionally and also in this period is accompanied with increased cleaning activities of mothers against insects and ants.

In the study by Matityahu & Vladimir, 2000 most poisonings were observed to occur in Summer and Autumn as compared to other seasons

Pesticides were the most common cause of poisoning in the present study which constituted about

34.4% (26.8% insecticides versus 4.1% rodenticides), followed by cleaning agents and medications (30% and 17.2%, respectively) due to the availability of pesticides which are used in a wide range at home to eliminate insects or rodents or at field in agriculture. Also this reflected the bad habit of still using concentrated cleaning substances for washing and cleaning and leaving them within reach of children. These findings were somewhat in agreement with those noticed by Abd El-Megid & Salem, 1995 who noted that the leading cause of acute poisoning among children in Alexandria Poison Center, Egypt during the year 1992 was household agents followed by food poisoning then drug poisoning respectively. Also Aglan, 2007 noted in his study of acute poisoning in children admitted at Ain Shams University in Cairo poison control center during the year 2004, that chemical and household products represent the highest percentage of poisoning (43.0%), most of them were Insecticide (29.53%), Corrosives (29.4%) and Hydrocarbons (20.54%). On the other hand medicinal products represent the second highest percentage of poisoning (36.0%) in his study. Our findings were also in agreement with the findings in studies conducted in some developing countries like in India (Rathore et al., 2013) and Nepal (Budhathoki et al., 2009) where ingestion of household products like chlorine bleach (Clorox), pesticides, disinfectants, kerosene and unidentified products ranked first. Whereas in studies conducted in Turkey and Iran (Andiran & Sarikayalar, 2004 and Ansari-Moghaddam et al, 2012) other agents such as poisoning due to medication over-dose was found to be the most common cause.

The majority of cases 49.2% were admitted to hospital from 2 to 4 hours of poisoning followed by cases which were admitted to hospital after 4 hours of the poisoning (30.8%) while 20% were admitted within two hours. This is in agreement with Alazab, 2012 who found that 65.5% of the studied patients reached the poisoning unit within 2 to 4 hours of poisoning, (24%) cases reached there within 4 to 6 hours, (7.3%) cases reached there after more than 6 hours, while (3.2%) cases reached there within less than 2 hours.

Early arrival time to hospital and seeking medical advice is significantly associated with high percent of cure in the present study where 69.5% of cured cases came to hospital within 4 hours of the onset of toxicity, while 73.3 % of dead cases arrived to hospital after more than 4 hours of the toxicity. The time between ingestion and hospital admission was reported to have a great effect on the outcome; this might be due to the early management and treatment especially poison antidotes. Bryant and Singer (2003) stated that the effectiveness of certain treatments depends upon how much time has elapsed since the poison was ingested. Other Studies recommended an early hospital admission in case of a suspected poison incident has occurred (Alanazi et al, 2016).

According to poison severity score (PSS), 65.8% and 9.7% of patients were of minor toxicity or asymptomatic cases respectively, this might be due to most of poisonings were accidental exposure to toxic

agents with lower percent of suicide. This was in agreement with previous study in India by Jose et al, 2012 where the largest number of poisoned cases in his study was score 1 or 0. On the contrary Alije et al, 2014 noted that according to clinical manifestations of cases in his study, moderate to severe cases were about 55.8% of cases while mild to asymptomatic cases were about 44.2%.

The majority of cases were admitted to toxicology department (90.4%) and 9.6% of cases who needed continuous monitoring or mechanical ventilation were admitted to the intensive care unit. This result was in agreement with that of Hassan & Siam, 2014.

As regards period of stay in hospital 74.6% of cases in the present study stayed from 1-<3 days, 16% stayed less than one day, 8.6% stayed from 3 to 7 days and only 0.8% stayed more than one week.

This was in contrast with results of the study done by Alazab, 2012 who showed that 67.3% of cases were discharged from hospital within less than 6 hours, 26.5% of cases were discharged within 6 to 12 hours, and 6.2% of cases were discharged after more than 12 hours. He noted that the severity of these cases was milder with cure of all cases without deaths as the selected age group in this study was those less than 5 years with no suicidal poisoning.

As regards the outcome in the current study, the majority of cases (95.9%) were completely cured, 2.1% with unknown outcome and discharged against medical advice on child guardian's responsibility. The death rate was about 2%. The mortality rate in other studies of pediatric poisoning ranging from 0.4% to 13% as Andiran & Sarikayalar, 2004 (0.4%), Rama et al, 2014 (7.4%) and Rathore et al, 2013 (13%).

As regards age with outcome for the fatal cases reported during the present study, 86.7% of dead cases were in age group between 12-18 years, while the least was in the age less than 2 years (13.3%). This may be explained by that quantities ingested in the younger age groups were small because these cases were accidental. On the contrary higher fatality in older children which were mainly females can be explained by that cases were due to intentional poisoning and with large quantity of poisons. This was in agreement with Rama et al, 2014 who noted that all except for one child aged 2 years were aged between 14 and 15 years. Significant relation in the current study was noticed between the (PSS) and the outcome of the studied cases as 86.7% of the dead cases had score 3 with severe toxicity this seems logic as the higher the severity of toxicity and life-threatening symptoms in patients the higher the liability for mortality.

Significant relation between the type of poisoning and the outcome was noted, as most of dead cases (86.7%) were due to pesticides poisoning (13 cases of 15) as pesticides are easily available and poorly regulated in the developing world and were mainly due to zinc phosphide poisoning (10 cases zinc phosphide versus 3 cases organophosphorous poisoning) because zinc phosphide is highly toxic substance, rapidly absorbed with no known antidotes besides that these

cases were suicidal in nature which usually take large amount of poison.

### Conclusion

In conclusion, the peak age of poisonings in children occurs in preschool age children, with a seasonal variation favor of Summer and Spring season. Pesticides and household cleaning agents were the most frequent agents of poisoning. The majority of cases was accidental and was completely cured. PSS is a good predictor of the outcome of the poisoned cases.

### Recommendations

We recommend that parents or any other caretakers of children must ensure that all medications, household cleaning agents or chemicals and toxic products are kept out of reach of children in a safe place and to keep it in their own containers, not to keep them in soft drink bottles. There should be legislation for the use of child resistant containers for household agents and drugs. To keep clean house with no holes or cracks so prevent snakes to get into the house and also not to walk outdoors with bare feet to avoid animal bites. Mass media such as television, radio and newspaper should create awareness about the problem and the potential hazards of these household poisons and give health education to parents to prevent this poisoning. There should be known hot lines for toxicological centers for communication. Early seeking of medical advice after exposure to poisoning is very important to save the patient and lessen the complication. PSS should be used in hospitals for classification of poisoned cases. Finally, good parental supervision is always necessary to prevent both accidental and suicidal poisoning specially in adolescents.

### References

- Abd El-Megid LA and Salem EM (1995): Children poisoning, prevention strategies. *Mansoura Journal of Forensic Medicine and Toxicology*; 3(2): 71-85.
- Aglan MA (2007): Epidemiologic retrospective study of acute poisoning in children attending Poison Control Center, Ain shams university in the year 2004 speculation of renal affection. Thesis: MSc Pediatrics. 2007.
- Ahmed B, Fatmi Z, Siddiqui A, et al. (2011): Predictors of unintentional poisoning among children under 5 years of age in Karachi: a matched case control study. *Pakistan Public Health J.* (26); 17-27.
- Akhtar S, Rani G and Al-Anezi F (2006): Risk Factors in Acute Poisoning in Children A Retrospective Study *Kuwait Medical Journal*; 38 (1): 33-36.
- Alanazi MQ, Al-Jeraisy M, and Salam M (2016): Severity scores and their associated factors among orally poisoned toddlers: a cross sectional single poison center study. *BMC Pharmacol Toxicol.*; 17: 1.
- Alazab RM (2012): Determinants of Acute Poisoning among Children (1-60) months Old at a Poisoning Unit of a University Hospital, Egypt, are Employed Mothers a Risk Factor?

- Retrospective Cohort Study *Journal of American Science*;8(9) .
- Alije K , Ramosaj A, Toro H, et al (2014): Acute poisoning in children; changes over the years, data of pediatric clinic department of toxicology. *Journal of Acute Disease*; 3(1): 56-58.
- Andiran N and Sarikayalar F (2004): Pattern of acute poisonings in childhood in Ankara: what has changed in twenty years? *Turk J Pediatr*; 46(2):147-52.
- Andrade AD, Lopes EE, dos Santos JC, et al. (2012): Prevalence of hospitalization by exogenous poisoning in hospital of high complexity in the city of Teófilo Otoni-MG in the years 2001 to 2005 and 2007. *Revista Pindorama [serial on the Internet]*; 3(2):1-10.
- Ansari-Moghaddam A, Martiniuk AL, Mohammadi M, et al.( 2012): The pattern of injury and poisoning in South East Iran. *BMC Int Health Hum Rights*;10 (12):17.
- Bacha T and Tilahun B (2015): A cross-sectional study of children with acute poisoning: A three-year retrospective analysis. *World J Emerg Med.*; 6(4): 265–269.
- Bryant S and Singer J. (2003): Management of toxic exposure in children. *Emergency Medicine Clinics of North America.*; 21: 101-119.
- Budhathoki S, Poudel P, Shah D, et al (2009): Clinical profile and outcome of children presenting with poisoning or intoxication: a hospital based study. *Nepal Med Coll J*; 11:170-5.
- Dawson B and Trapp R (2001): Basic and clinical biostatistics: large medical books. Oxford, London. Boston, pp 270–275.
- Hahn RC, Labegalini MP and Oliveira ML (2013): Features of acute poisoning in children: a study in center toxicological. *BJSCR*; 4:18-22.
- Hassan B and Siam M (2014): Patterns of Acute Poisoning in Childhood in Zagazig, Egypt: An Epidemiological Study. *International Scholarly Research Notices*; Volume 2014 Article ID 245279, 5 pages.
- Jose A, Sivanandam S and Matthai J (2012): Poisoning in Children from an Educationally and Economically Advanced Urban Area of South India. *Asian Journal of Epidemiology*. 5(4):123-129.
- Matityahu L and Vladimir G (2000): Acute poisoning in children. *Israel Medical Association Journal*; 2: 504-506.
- Mowry JB, Spyker DA, Brooks DE, et al. (2015): 2014 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 32nd Annual Report. *Clin Toxicol*; 53(10): 962-1147.
- Paudyal BP (2005): Poisoning: pattern and profile of admitted cases in a hospital in central Nepal. *J Nepal Med Assoc.*; 44(159):92-6.
- Persson HE, Sjoberg GK, Haines JA, et al. (1998): Poisoning Severity score. Grading of acute poisoning. *J ToxicolClinToxicol*; 36 (3):205-13.
- Rama P, Kanchan T and Unnikrishnan B (2014): Pattern of acute poisonings in children below 15 years - A study from Mangalore, South India; *Journal of Forensic and Legal Medicine*; 25: 26-29.
- Rathore S, Verma AK, Pandey A, et al (2013): Pediatric poisoning trend in Lucknow district, India. *J Forensic Res*; 4:179.
- Sandra AD (2010): Poisoning among children – United States. *MMWR*; 33:129-31.
- WHO (2008): Children and poisoning. World report on child injury preventi: available at [http://www.who.int/violence\\_injury\\_prevention/child/en/](http://www.who.int/violence_injury_prevention/child/en/)

## الملخص العربي

### دراسة حالات التسمم الحاد في الأطفال الواردين الي مركز علاج التسمم بمستشفى جامعة المنوفية على مدى عام (٢٠١٦) "دراسة مستقبلية"

فاطمة شعبان قنديل و ريهام حسن الفرعوني

يعد تسمم الأطفال من اهم المشكلات الصحية في الدول النامية والمتقدمة على حد سواء والتي تمثل سببا هاما للحالات المرضية والوفيات في الأطفال والمراهقين.

ولذلك كان الهدف من هذا البحث هو دراسة هذه المشكلة من حيث العوامل الديموجرافية ودرجة خطورة التسمم لهذه الحالات من الناحية الإكلينيكية وكذلك مصير هذه الحالات.

وقد أجريت هذه الدراسة على جميع حالات التسمم في الأطفال والتي ادخلت لمركز التسمم والإدمان بجامعة المنوفية على مدار عام ٢٠١٦ وقد بلغ عدد هذه الحالات ٧٦٠ حالة والتي تمثل ٣٤,٥% من حالات التسمم التي ادخلت المركز في نفس الفترة . وقد تم عمل استمارة طبية لكل حالة تشمل البيانات الخاصة بما وكذلك الفحص الإكلينيكي ، وتم تقسيم الحالات تبعا لدرجة الخطورة إلى حالات بسيطة، متوسطة، خطيرة ومميتة وكذلك ما ألت اليه عند خروجها من المستشفى.

وقد كان من أهم نتائج البحث أن عدد هذه الحالات هو ٧٦٠ حالة والتي تمثل ٣٤,٥% من اجمالي عدد حالات التسمم في هذه الفترة . وقد أوضحت الدراسة أن حالات التسمم في الذكور كانت تمثل ٥٥,٥% مقابل ٤٤,٥% من الإناث وكان أكثر الفئات العمرية تعرضا للاصابة بالمواد السامة هي الفترة العمرية من ٢-٦ سنوات.

وقد كانت المبيدات الحشرية بمختلف أنواعها من أكثر المواد استخداما (٣٤,٤%) متنوعا بالمواد المستخدمة في التنظيف (٣٠%) وقد كان التسمم في معظم الحالات بطريقة عرضية (٩١,٧%) بينما كان الانتحار يمثل ٨,٣% من الحالات ولا توجد حالات تسمم بطريقة جنائية بغرض محاولة القتل. وقد كان التسمم عن طريق الفم من أكثر طرق التعرض للتسمم (٩٢,٦%) في الأطفال مقارنة بالطرق الأخرى. وقد كان فصلي الصيف والربيع من أكثر الفصول لحدوث هذا التسمم.

وبالنسبة لدرجة خطورة التسمم من الناحية الإكلينيكية تبين أن ٦٥,٨% من الحالات كانت من الدرجة البسيطة, ٢١,٧% من الدرجة المتوسطة, و ٢,٨% من الدرجة الخطيرة و ٩,٧% لم يعانون من اية اعراض. وق تم علاج معظم الحالات بالقسم ما عدا نسبة حوالي ٩,٦% تطلب علاجها دخولها للعناية المركزة. وقد غادرت معظم الحالات بعد شفائها (٩٥,٩%) وكان نسبة حالات الوفاة حوالي ٢% نتيجة استخدامهما لأنواع من السموم شديدة الخطورة وباقي الحالات خرجت تبعا لرغبة اولياء الامور

وأخيرا نوصي بتوعية العائلات بالأثار الخطيرة للمبيدات الحشرية والمواد المستخدمة في عملية تنظيف البيت من مواد كاوية ومواد هيدروكربونية وكذلك الادوية الموجودة بالبيت مع ضرورة وضع هذه المواد في اماكن بعيدة عن متناول الطفل مع وضعها في عبوتها الخاصة بها وعدم وضعها في زجاجات المياه الغازية والمشروبات الأخرى. مع ضرورة عرض جميع حالات الإنتحار على أخصائي النفسية والعصبية لفحصها وعلاجها ومحاولة تقليل حدوث مثل هذه المحاولات في مجتمعنا.